

Recently a new nomenclature has been proposed which systematically classifies the Cry proteins based upon amino acid sequence homology rather than upon insect target specificities. This classification scheme is summarized in Table 1.

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**TABLE 1**  
**REVISED *B. THURINGIENSIS*  $\delta$ -ENDOTOXIN NOMENCLATURE<sup>A</sup>**

<b>New</b>	<b>Old</b>	<b>GenBank Accession #</b>
CryIAa	CryIA(a)	M11250
CryIAb	CryIA(b)	M13898
CryIAc	CryIA(c)	M11068
CryIAd	CryIA(d)	M73250
CryIAe	CryIA(e)	M65252
CryIBa	CryIB	X06711
CryIBb	ET5	L32020
CryIBc	PEG5	Z46442
CryIBd	CryE1	U70726
CryICa	CryIC	X07518
CryICb	CryIC(b)	M97880
CryIDa	CryID	X54160
CryIDb	PrtB	Z22511
CryIEa	CryIE	X53985
CryIEb	CryIE(b)	M73253
CryIFa	CryIF	M63897
CryIFb	PrtD	Z22512
CryIGa	PrtA	Z22510
CryIGb	CryH2	U70725
CryIHa	PrtC	Z22513
CryIHb		U35780
CryIIa	CryV	X62821

New	Old	GenBank Accession #
Cry1Ib	CryV	U07642
Cry1Ja	ET4	L32019
Cry1Jb	ET1	U31527
Cry1K		U28801
Cry2Aa	CryIIA	M31738
Cry2Ab	CryIIB	M23724
Cry2Ac	CryIIC	X57252
Cry3A	CryIIIA	M22472
Cry3Ba	CryIIIB	X17123
Cry3Bb	CryIIIB2	M89794
Cry3C	CryIIID	X59797
Cry4A	CryIVA	Y00423
Cry4B	CryIVB	X07423
Cry5Aa	CryVA(a)	L07025
Cry5Ab	CryVA(b)	L07026
Cry5B		U19725
Cry6A	CryVIA	L07022
Cry6B	CryVIB	L07024
Cry7Aa	CryIIIC	M64478
Cry7Ab	CryIIICb	U04367
Cry8A	CryIIIE	U04364
Cry8B	CryIIIG	U04365
Cry8C	CryIIIF	U04366
Cry9A	CryIG	X58120
Cry9B	CryIX	X75019
Cry9C	CryIH	Z37527
Cry10A	CryIVC	M12662
Cry11A	CryIVD	M31737

New	Old	GenBank Accession #
Cry11B	Jeg80	X86902
Cry12A	CryVB	L07027
Cry13A	CryVC	L07023
Cry14A	CryVD	U13955
Cry15A	34kDa	M76442
Cry16A	cbm71	X94146
Cry17A	cbm71	X99478
Cry18A	CryBP1	X99049
Cry19A	Jeg65	Y08920
Cyt1Aa	CytA	X03182
Cyt1Ab	CytM	X98793
Cyt1B		U37196
Cyt2A	CytB	Z14147
Cyt2B	CytB	U52043

<sup>a</sup>Adapted from: [http://epunix.biols.susx.ac.uk/Home/Neil\\_Crickmore/Bt/index.html](http://epunix.biols.susx.ac.uk/Home/Neil_Crickmore/Bt/index.html)

### 1.2.3 CRYSTAL PROTEINS FIND UTILITY AS BIOINSECTICIDES

The utility of bacterial crystal proteins as insecticides was extended when the first isolation of a coleopteran-toxic *B. thuringiensis* strain was reported (Krieg *et al.*, 1983; 1984). This strain (described in U. S. Patent 4,766,203, specifically incorporated herein by reference), designated *B. thuringiensis* var. *tenebrionis*, is reported to be toxic to larvae of the coleopteran insects *Agelastica alni* (blue alder leaf beetle) and *Leptinotarsa decemlineata* (Colorado potato beetle).

U. S. Patent 5,024, 837 also describes hybrid *B. thuringiensis* var. *kurstaki* strains which showed activity against lepidopteran insects. U. S. Patent 4,797,279 (corresponding to EP 0221024) discloses a hybrid *B. thuringiensis* containing a plasmid from *B. thuringiensis* var. *kurstaki* encoding a lepidopteran-toxic crystal protein-encoding gene and a plasmid from *B. thuringiensis tenebrionis* encoding a coleopteran-toxic crystal protein-encoding gene. The hybrid *B. thuringiensis* strain produces crystal proteins